

# **CALCULATOR DEVICE**

## **FIELD OF THE INVENTION**

The present invention relates to a calculator device and particularly a calculator device that equips dual function of a keypad and a calculator.

## **BACKGROUND OF THE INVENTION**

The commonly used keyboards for notebook computers or conventional keyboards have sufficient number of button keys when using with general software. However when new generations of software are loaded into computers for processing, some computer peripheral devices cannot be used and must be replaced. For instance, the upcoming WIN2000 software has about twenty additional hot-key function when loading into computers. When the conventional keyboards do not support or execute these twenty hot-key function, they have to be replaced, or application will be restricted.

Some producers have developed external connecting keypads to link with personal computers or television sets. The keypads have recorded software for hot-key or Num lock switching. When the hot-key or Num lock button key is depressed, the switching software will automatically switch the function of hot-key or Num lock. Hence every key top on the keypad has printed with at least

two numerals, notation or menu for users to select and use.

Although the keypads can offer users many benefits, when doing calculation for drawings or data processing, users still have to prepare another set of calculator. It is not convenient.

## 5 **SUMMARY OF THE INVENTION**

The primary object of the invention is to resolve the foregoing disadvantages. The invention provides a keypad that includes calculator function. When users want calculator function, they only have to depress a switch button key on the keypad, then the keypad  
10 will be switched to calculator function. Thus users can enjoy a lot more convenience.

Another object of the invention is to add a power supply to the keypad so that when the keypad is not connected to the computer, the keypad may still be used as a calculator independently.

15 To achieve aforesaid objects, the calculator device of the invention consists of a power supply unit, a power supply detection unit, an input unit, a processing unit, an USB (Universal Serial Bus) interface unit, an USB connection unit, a first display unit and a second display unit. When the keypad is to be idled temporarily,  
20 users may depress the switch button key (or switch) on the keypad to change the function to the calculator to perform calculations desired. The calculation results will be displayed on the first display unit. The second display unit can indicate the functional status of the keypad, i.e. for keypad function or calculator function.

The foregoing, as well as additional objects, features and advantages of the invention will be more readily apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

## 5 **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a schematic view of the invention function as a calculator device.

FIG. 2 is a block diagram of the calculator circuit of the invention.

10 FIG. 3 is a circuit diagram for FIG. 2.

FIG. 4 is a software control process flow of the invention.

## **DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to FIG. 1, the invention mainly adds a calculator device 2 to a keypad 1 such that when the keypad 1 is connected to a computer the keypad 1 may function as usual for entering operation commands to the computer, and when the keypad 1 is temporarily not used, users may depress a switch button key 12 (or switch) to switch the keypad to calculator function. Users then can perform numeric calculations and display the processing results on a display unit 3 to enhance users' convenience. The keypad 1 has another display unit 4 to indicate the keypad functional status, i.e. as general keypad function or calculator function.

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Referring to FIGS. 2 and 3, the calculator device 2 included in

the keypad 1 of the invention consists of a power supply unit 21, a power supply detection unit 22, an input unit 23, a processing unit 24, an USB interface unit 25, an USB connection unit 26, a first display unit 3 and a second display unit 4.

- 5 The power supply unit 21 includes a battery to provide power source required for the circuits used in the invention.

The power supply detection unit 22 links to the power supply unit 21 to detect whether power supply is provided by the battery or the computer.

- 10 The input unit 23 includes button key clusters 11 (as shown in FIG. 1) and a plurality of switch button keys (or switches) 12 on the keypad 1. The button key clusters 11 may be used for commands or numeric operations. Under the control of software, some button keys of the button key clusters 11 may be set for switching  
15 calculating function or conversions. In addition, one of the switch button keys 12 may be set for switching the function of keypad 1 or calculator device 2, the remaining switch button keys 12 may be used for performing switch or conversion of various calculating function.

- 20 The processing unit 24 connects the input unit 23 and power supply detection unit 22 to receive signals output from the input device 23 and signals detected by the power supply detection unit 22 to perform calculation or determination.

- The USB interface unit 25 links to the processing unit 24 for  
25 transmitting calculated or processed signals from the processing

unit 24 to a PC (personal computer) for further processing.

The USB connection unit 26 bridges the USB interface unit 25 and the PC for transmitting output signals from the processing unit 24 to the PC, or receiving power supply transmitted from the PC.

- 5     The first display unit 3 connects the processing unit 24 for displaying resulting data or numerals processed by the processing unit 24.

10     The second display unit 4 is a light bulb or light emitting diode linking to the processing unit 24 to receive signals output from the processing unit 24 for indicating functional status of the keypad 1 or the calculator device 2.

- 15     Referring to FIG. 4 for the software processing flow of the invention, when the software is initiated for operation, first, determine whether power supply is come from the battery. If the outcome is positive, activate the calculator and perform calculator function. Then determine if the depressing button key value is KB/Cal. If positive, go to the activating keypad function; if negative (not KB/Cal), determine if the SEND button key is depressed. If the SEND button key is not depressed, branch to  
20     processing calculator function; if the SEND button key is depressed, determine if having link to the PC. If negative (no PC), go to the calculator function; if positive (linked to PC), transmit calculation results to the UBS interface unit and transfer the calculation results to USB button key data format, and send the data  
25     through the UBS interface unit to the PC, then return to perform

calculator function.

In the foregoing processes, when power supply is determined not from the battery, activate the keypad function, then determine if the button key value sent by the processing unit. If negative, go to  
5 activating keypad function; if positive (keypad button key), determine if the button key value is KB/Cal. If positive (is KB/Cal.), go to activating calculator; if negative (not KB/Cal.), the USB interface unit transfers the button key value to an USB data format and sends the button key to the PC. Thus complete the  
10 switching between the keypad function and calculator device function.